

Notice of Allowability

Application No.

10/773,432

Applicant(s)

INOUE, JUNICHI

Examiner

Art Unit

Xiuqin Sun

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/09/2004.
2. ☒ The allowed claim(s) is/are 1-3.
3. ☒ The drawings filed on 09 February 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>02/09/2004</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-3 are allowed.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 1-3 is the inclusion of the limitation of an electronic control unit for repeatedly performing filter processing on the air-fuel ratio measured by the linear air-fuel ratio sensor, using a formula

$$V_f(n) = (1-G) \times V_f(n-1) + G \times V(n) ,$$

where $V(n)$ represents a voltage value corresponding to the air-fuel ratio measured by the linear air-fuel ratio sensor,

$V_f(n-1)$ represents a previous computed value from the filter processing,

G ($0 \leq G \leq 1$) represents a filter gain expressing a computational ratio of $V(n)$ and $V_f(n-1)$, and

$V_f(n)$ represents a current computed value of the filter processing, wherein, in a case where a temperature of the linear air-fuel ratio sensor is below a predetermined temperature, the electronic control unit cuts off a pump current to the linear air-fuel ratio sensor, performs the filter processing with the filter gain G set to a first predetermined value, and transforms a computed value from the filter processing into a theoretical air-fuel ratio voltage; and in a case where the temperature of the linear

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air-fuel ratio sensor rises to or above the predetermined temperature, the electronic control unit performs the filter processing with the filter gain G set to a second predetermined value that is smaller than the first predetermined value, and computes an air-fuel ratio from the difference between a computed value from the filter processing and the theoretical air-fuel ratio voltage. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior Art Citations

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Iida et al. (U.S. Pub. No. 20040025856) is entitled to "Apparatus for detecting deterioration of air-fuel ratio sensor".

2) Morinaga et al. (U.S. Pat. No. 6830043) is entitled to "Secondary air supply abnormality detection system".

3) Makki et al. (U.S. Pub. No. 20040249556) is entitled to "Engine control and catalyst monitoring based on estimated catalyst gain".

4) Honda (U.S. Pub. No. 20010000956) is entitled to "Resistance component detecting apparatus for an oxygen concentration sensor and oxygen-concentration detecting apparatus".

5) white et al. (U.S. Pat. No. 5392598) is entitled to "Internal combustion engine air/fuel ratio regulation".

6) Yakuwa et al. (U.S. Pat. No. 4951632) is entitled to "Exhaust gas component concentration sensing device and method of detecting failure thereof".

7) Takaku (U.S. Pat. No. 6089016) is entitled to "Diagnostic equipment for an exhaust gas cleaning apparatus".

8) Yamada et al. (U.S. Pat. No. 6210641) is entitled to "Air-fuel ratio control system and gas sensor for engines".

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

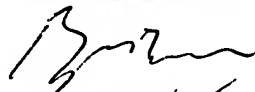
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

XS

February 28, 2005

Xiuqin Sun
Examiner
Art Unit 2863

BRYAN BUI
PRIMARY EXAMINER


3/2/05